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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/318,159	05/25/1999	HOWARD E. RHODES	M4065.0335/P335-A	9990

7590 10/22/2002

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EXAMINER	
MUNSON, GENE M	
ART UNIT	PAPER NUMBER
2811	

DATE MAILED: 10/22/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

9/m

Office Action Summary

Application No.	Applicant(s)	
318,159	H. RHODES	
Examiner	Group Art Unit	
G. MUNSON	2811	

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE THREE MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

☒ Responsive to communication(s) filed on 3, 9 September 2002.

☐ This action is **FINAL.**

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle,* 1935 C.D. 1 1; 453 O.G. 213.

Disposition of Claims

☒ Claim(s) 45, 46, 50-52, 54-56, 59, 60, 68-70, 73, 74, 77 is/are pending in the application.

Of the above claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 45, 46, 50, 54-56, 59, 60, 68-70, 73, 74, 77 is/are rejected.

☒ Claim(s) 51, 52 is/are objected to.

☐ Claim(s) _____ are subject to restriction or election requirement

Application Papers

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).

☐ All ☐ Some* ☐ None of the:

☐ Certified copies of the priority documents have been received.

☐ Certified copies of the priority documents have been received in Application No. _____.

☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

*Certified copies not received: _____.

Attachment(s)

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☐ Notice of Reference(s) Cited, PTO-892

☐ Notice of Informal Patent Application, PTO-152

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Other _____

Office Action Summary

Examination is continued under 37 CFR 1.114.

Claims 54-56, 59, 60, 73 and 74 are rejected under 35 U.S.C. 112, second paragraph. In claim 73, an "increased" doping concentration relative to what is unclear. Compare with claim 68.

The process terminology (claim 73) is considered only in terms of a necessary *resultant structure* from the process. The process itself is not at issue. The device claims are *not* limited to the recited process. See MPEP 2113; *In re Brown*, 173 USPQ 685 (CCPA 1972); *In re Fitzgerald*, 205 USPQ 594 (CCPA 1980); *In re Marosi*, 218 USPQ 289, 292-293 (CCPA 1983); *In re Thorpe*, 227 USPQ 964 (CAFC 1985). In terms of *resultant structure*, the "ion implanted" region is taken as a region of N or P conductivity type.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 45, 46, 50, 54-56, 68-70, 73, 74 and 77 are rejected under 35 U.S.C. 103 as unpatentable, the evidence being Schuegraf et al, Kooi et al and Joo et al, considered together. The "first" area and dielectric material reads on dielectric film 24 of Schuegraf et al (Figure 3D); the "second" area and dielectric material reads on different dielectric material 26. For a "field implant dose" as in Schuegraf et al (column 4, lines 32-36, "field threshold voltage is influenced by a number of physical and material properties of the trench isolator such as . . . substrate doping,

field implant dose"), it would have been obvious to use a field implant region with a higher doping concentration similar to zone 6, 28 or 44 of Kooi et al (Figures 2, 10, 17), or layer 68 of Joo et al (Figure 15). Such an obvious field implant region would be a channel stop as in Joo et al. An "active" region reads on a region adjacent a trench which is "displaced away from" a field implant doped region under trench dielectric 26 (claims 70, 73). The "memory" device (claims 46, 73) or "memory cell" (claim 77) reads on a typical DRAM application taught by Schuegraf et al (column 4).

The impurity concentration of a field implant region establishes a "field threshold voltage" (claims 50, 54) as noted by Schuegraf et al (column 4, lines 32-36, "field threshold voltage is influenced by a number of physical and material properties of the trench isolator such as . . . substrate doping, field implant dose"). The "first" dielectric material 24 is "on a bottom" of an "isolation" trench 22 (claims 69, 74). A field implant region below trench dielectric 26 is "displaced" from a surface "active" region adjacent to the trench 22 by at least a fraction of the depth of the trench (column 4, lines 23-26, 200 nm equals 2000 angstroms), which fraction would equal at least 100 angstroms (claim 45).

The width of a isolation trench is approximately 250 nm (column 4, lines 23-26), the thickness of "first" area dielectric 24 is at least 5 nm (column 5, lines 12-15), so that the "first" area on both sides of trench 22 would be 10/250, which is less than 40 percent, of the width of the isolation trench (claim 55). At least "about" 100 angstroms (claim 56) is taken to encompass at least 50 angstroms. Alternatively, it would have been obvious to chose a thickness of dielectric

material 24 comparable and consistent to at least 50 angstroms (5 nm) suggested by Schuegraf et al.

The conclusion is that the claimed invention as a whole would have been obvious at the time the invention was made to a person of ordinary skill in the art. The hypothetical person of ordinary skill in the art, familiar with all that Schuegraf et al, Kooi et al and Joo et al disclose, "would have found it obvious to make a structure corresponding to *what is claimed.*" *In re Sovish*, 226 USPQ 771, 774 (Fed. Cir. 1985).

The references are of record.

Claims 51 and 52 are objected to as dependent upon a rejected claim but would be allowable over the art of record if each were put in completed form as independent claims, including all limitations of claims 51, 68; 52, 68.

Any inquiry concerning this communication should be directed to G. Munson at telephone number (703) 308-4925 or 0956.

Munson

10/18/02

Gene M. Munson

GENE M. MUNSON
EXAMINER
GROUP ART UNIT 2811